



Stereonet of critical mud weight for wellbore stability based on hole deviation and azimuth

**7-8 April, 2020 in Denver, CO**

## **“Introduction to Geomechanics Theory and Application”**

**by Amy Fox, PhD**

**This 2-day workshops will introduce basic elements of geomechanics, data types and workflows to build a geomechanical model, which can then be applied to exploration, drilling, completions and full field development. It will also introduce geomechanical risks associated with oil and gas activity such as subsidence and induced seismicity.**

Petroleum geomechanics is a unique, multidisciplinary field that combines elements of rock mechanics, geology, geophysics and engineering. Although it has been around for several decades, addressing issues such as wellbore stability, fault seal/leakage and sand production, geomechanics started receiving increasing attention with the advent of unconventional resources, where the mechanical behavior of the reservoir is a key factor in successful development programs.

The course is focused on conveying an understanding of why an accurate geomechanical model is necessary and how it can inform decisions made by various stakeholders within an oil and gas organization. A wide range of data types and analyses are discussed and prioritized. Class time is split between lectures, examples, and hands-on exercises.

**Amy Fox will be available during this week to visit companies for a ½ or 1 day visit for mentoring and advisory. Contact us to schedule.**



**Amy D. Fox, Ph.D.**

Amy Fox earned an undergraduate degree in Geology from the University of New Hampshire and a Masters and PhD in Geophysics from Stanford University. She started her consulting career in 1998 with GeoMechanics International (GMI) in Palo Alto, California. Between 2004 and 2007 she earned her doctorate, completing a thesis entitled “Characterization and Modeling of In Situ Stress Heterogeneity.” Immediately afterwards, GMI asked her to create a training program and career progression for their technical staff of 50+ people globally.

Baker Hughes bought GMI in 2008, and in 2009 Amy moved into a corporate training and development role. In 2011 she returned to operations and soon moved to Canada. She has authored or coauthored several articles for industry publications and enjoys giving lectures at luncheons and conferences.

Extremely dedicated to her field, her every effort is an attempt to promote the understanding and application of the geomechanics discipline.

## Course Outline

### 1. Introduction

- Participant introductions
- Instructor background
- Discussion: What is geomechanics?
- Course goals and learning expectations

### 2. The Big Picture

- History (and future!) of geomechanics in oil and gas
- Overview of geomechanics in exploration, drilling, completions and production

### 3. Basic Theory

- In situ stresses – definition, causes, global and local variability
- Pore pressure – definition, controls on, basinal/play variability
- Rock mechanics – property definitions, test/data types, anisotropy
- Borehole stresses and wellbore failure types
- Natural fractures and faults – types, identification of, mechanical stability

### 4. Developing a Geomechanical Model

- Reviewing drilling experience
- Determining stress directions
- Calculating overburden
- Determining minimum stress
- Determining pore pressure
- Calculating and calibrating rock mechanical properties
- Modeling to determine maximum horizontal stress
- Verifying the model against area experience

### 5. Geomechanics Applications in More Detail

- Wellbore stability and drilling performance improvement, including deriving safe drilling mud weight windows
- Hydraulic fracturing and hydraulic fracture modeling
- The effects of depletion and injection - sand production, induced seismicity, caprock integrity, well integrity and more

**COMIN UP IN DENVER, CO 21-22 October, 2020**

**“Fractured, Fracturing, and Fracked Reservoirs” Sherilyn Williams-Stroud**

<b>Date:</b>	<b>7 – 8 April, 2020</b>
<b>Time:</b>	<b>8:30 am – 4 pm</b>
<b>Price:</b>	<b>\$1500 regular, \$1350 discounted*</b> <i>*TerraEx clients, more than 2 from same company, more than 1 workshop</i>
<b>Included:</b>	<b>Training manual, hot lunch buffet, breakfast, beverages</b>
<b>Venue:</b>	<b>Denver, CO venue TBD</b>
<b>Register:</b>	<b><a href="#">Click here</a> or contact TerraEx Group at <a href="mailto:info@terraexgroup.com">info@terraexgroup.com</a>, + (303) 319 3043</b>